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IDENTIFYING AND TEACHING CREATIVITY--DIFFERENCES BETWEEN HIGH AND LOW ABILITY STUDENTS. THE GENERAL COLLEGE STUDIES, UNIVERSITY OF MINNESOTA, VOLUME I, NUMBER 3, 1963-1965.

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TO DETERMINE WHETHER STUDENTS OF HIGH AND LOW ABILITY DIFFER IN CREATIVITY, STUDENTS IN GENERAL COLLEGE (GC) SPEECH AND LOGIC CLASSES AT THE UNIVERSITY OF MINNESOTA WERE COMPARED WITH SPEECH AND LOGIC STUDENTS IN THE COLLEGE OF LIBERAL ARTS (CLA). GC STUDENTS HAVE A MEAN IQ OF 105-110, AND AN AVERAGE HIGH SCHOOL RANK AT THE 25TH PERCENTILE WHILE CLA STUDENTS HAVE A MEAN IQ OF 115-120 AND RANK ABOVE THE 70TH PERCENTILE IN THEIR HIGH SCHOOL CLASSES. GC STUDENTS EARN LOWER SCORES ON THE AMERICAN COLLEGE TESTS. THE MINNESOTA TESTS OF CREATIVE THINKING, ABBREVIATED FORM VII, WERE GIVEN TO BOTH GROUPS. TEST RESULTS INDICATE ONLY ISOLATED DIFFERENCES BETWEEN FRESHMEN AND SOPHOMORES WITHIN EACH OF THE COLLEGES. CLA MEN DIFFERED LITTLE FROM GC MEN, WHILE CLA WOMEN'S SCORES WERE SIGNIFICANTLY HIGHER THAN THOSE OF GC WOMEN IN PARTS OF ORIGINALITY, FLEXIBILITY AND ELABORATION FACTORS. GENERALLY, THE DIFFERENCE BETWEEN THE SCORES OF GC AND CLA STUDENTS IS SMALLER ON THIS TEST OF CREATIVITY THAN ON THE TRADITIONAL TESTS MOST FREQUENTLY USED TO COMPARE THE TWO GROUPS. FOR OTHER REPORTS IN THIS SERIES, SEE JC 670 962 AND JC 670 969. (HH)

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IDENTIFYING AND TEACHING CREATIVITY:

DIFFERENCES BETWEEN HIGH AND LOW ABILITY STUDENTS

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Perhaps the most significant aspect of current research into student creativity on this campus as well as, for instance, at Macalester College and the State University of New York at Buffalo, is that such studies challenge entrenched assumptions about the measurement of learning potential. The academic community long has relied upon IQ tests as a means of describing ability levels in students. Only recently has it been recognized that academic skills can be gauged in several different ways, and that there is more to measuring the potential for achievement than usually can be found in traditional IQ tests.

An example of the growing awareness of the importance of creativity as a significant factor in achievement is found in the following excerpt from an editorial appearing in the Christian Science Monitor (March 5, 1967):

> A group of physical scientists was asked to rank according to their importance in scientific research 28 different mental abilities. IQ tests generally cover only a handful of these - general reasoning, vocabulary ability, number ability, memory for ideas, ability to visualize spatially, and, perhaps, perceptual speed.
>
> It was found that all but one of these traditional intelligence factors ranked below twentieth in the list. The scientists placed first the ability to abandon conventional problem solving methods that have become unworkable and to think of an original solution.
>
> IQ tests discriminate against such central aspects of intelligence as imagination, creativity, insight...tend to emphasize the trivial at the expense of the consequential, and present a grossly oversimplified picture of mental organization....

This statement provides an admirable introduction to the last of the studies of creativity presented in the first volume of The General College Studies. In this final report, Professors Amram and Giese outline results of their attempts to measure the difference in creative potential among high and middle ability college students. The report is followed by a bibliography of ten basic books devoted to aspects of relationships between creativity and education.

JC 670 990

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CREATIVITY : DIFFERENCES BETWEEN HIGH AND LOW ABILITY STUDENTS

Introduction

In earlier studies, we wrote about a specific population - the students in the General College of the University of Minnesota. Here, we are reporting our investigation of the relationship between academic achievement and creative problem solving. To test this relationship, we compared several General College groups with several classes in the University's College of Liberal Arts.

Most prominent among those who have studied the relationship between creativity and intelligence are Getzells and Jackson,[1] Guilford,[2] and MacKinnon,[3] who seem to agree generally that, although a minimum level of intelligence (as measured by IQ) is necessary for creative behavior, creativity and intelligence (as measured by IQ) are not closely related. The independence is especially apparent in persons with fairly high intellectual capacity.

MacKinnon points out that just as creativity includes a variety of factors so is "intelligence a many faceted thing."[4] IQ tests measure verbal and spatial intelligence as well as other factors. Certainly one cannot expect a total IQ score to be related to a total creativity score any more than he expects IQ scores to be related to manual dexterity. It is for these reasons that we agree with Guilford that IQ alone is not adequate for describing the behavior or potential of an individual. Through these investigations we hope to provide some additional basis for quantification of creative behavior.

In the present investigation, we chose to compare two populations whose achievement in school has been different. Although we know that the average IQ of the two groups is different, we are

not isolating this factor as the only difference between the two groups. Success, or lack of it, in school may reflect personality characteristics as well as IQ scores. Most of the students attending the General College (GC) do so because, as a result of high school performance and/or test performance; they were not accepted by other colleges. We are comparing students from this population with students taking classes in the College of Liberal Arts (CLA). A student is allowed to enroll in CLA if the average of his rank in his school graduating class and his score on the Minnesota Scholastic Aptitude Test is 40 or over. He clearly is a member of a scholastically superior group. GC students have an average IQ of 105-110 and an average High School Rank of 28%, but CLA students have an average IQ of 115-120 and an average HSR of 70% for men and 80-85% for women.

Another device for comparing these groups is found in the score of the ACT, a test devised by the American College Testing Program. The median for all 12th graders who took the test is 16. Those 12th graders who indicated that they were college bound earned a median on the ACT of 20. Entering freshmen at the University of Minnesota's Institute of Technology earned a median score of 26, while entering freshmen in the College of Agriculture, Forestry and Home Economics earned a 22 median score Male freshmen entering CLA earned a median ACT score of 24, while female freshmen earned a score of 23. Male freshmen entering GC earned a median of 17, while female freshmen earned a score of 16. Again we can see that the CLA population is a scholastically superior group and the GC population is more typical of all high school seniors.

During the Spring quarter of 1963, we administered Torrance's Abbreviated Form VII, Minnesota Tests of Creative Thinking,[5] to a CLA class in logic (Philosophy 2) and two CLA beginning speech classes (Speech 5). In General College, one logic class (GC 5B) and three beginning speech classes (GC 32A) were tested. GC 5B is described in The General College Studies 1(2):2-3. The college catalogues describe the remaining classes as follows:

Philosophy 2. Logic. Difference between logical and fallacious reasoning; functions and uses of language; rules of good definition and sound argument.[6]

Speech 5. Fundamentals of Speech. Development of basic skills in meeting a variety of speech situations: extemporaneous speaking, oral reading. discussion. Development of basic understanding of speech processes and forms.[7]

GC 32A. Oral Communication: Basic Principles. The student is introduced to the basic principles of speech. By means of such assignments as an introduction, a demonstration, an argument, and a group discussion, he is given an opportunity to apply these principles. Through these classroom projects the student is helped to develop confidence in himself, to express his ideas clearly and effectively, and to listen critically.[8]

Method

We began this investigation by simply comparing the means of the GC logic class with the means of the CLA logic class. We also compared the means of the GC speech classes with the means of the CLA speech classes. We quickly discovered that the inconsistent results between the logic groups and the speech groups reflected a naive oversimplification in experimental design. While the inconsistent findings could have been due to differences in students registering for speech and logic classes, a closer examination of the sample groups showed differences between the

two classes in number of girls registered and in number of upperclassmen (juniors and seniors) registered. It became clear that our initial design was too superficial, and a more sophisticated design comparing subgroups would be necessary.

We decided to make the following comparisons: In the speech classes we compared GC female freshmen with CLA female freshmen, and GC male sophomores with CLA male sophomores. In the logic classes we compared GC male freshmen with GC male sophomores, CLA male freshmen with CLA male sophomores, GC male freshmen and and sophomores with CLA male freshmen and sophomores, GC female freshmen and sophomores with CLA female freshmen and sophomores, all male freshmen and sophomores with all male juniors and seniors, and all female freshmen and sophomores with all female juniors and seniors.

Clearly other subgroup comparisons are desirable. Some were not made because the number of subjects seemed to us to be too small. Other comparisons were not made because of statistical considerations.

Sample sizes for the various groups were as follows:

Logic classes

GC students 68

CLA students. 83

GC male freshmen. 27

GC male sophomores. 24

CLA male sophomores 28

CLA male freshmen 17

CLA male juniors and seniors. . . 19

GC female freshmen and sophomores 16

CLA female freshmen and sophomores. . . 9

CLA female juniors and seniors. 7

Speech classes

GC students 55

CLA students. 36

GC male sophomores. 10

CLA male sophomores 12

GC female freshmen. 12

CLA female freshmen 10

Results

Table 1 shows the mean scores for GC and CLA students enrolled in speech and logic classes for each of the tasks of the test of creativity and for the subtotal and total scores on the test. The most important information on Table 1 is the t-values, which compare the mean scores between GC and CLA.

Of the various significant differences found between GC and CLA speech classes, the most meaningful ones occurred in the verbal flexibility tasks and the non-verbal originality tasks because of the consistent significance of the F-Ratios. The most consistent differences in the logic groups occurred in verbal and non-verbal elaboration. In all cases identified on Table 1 where significant differences were found, the CLA groups had the higher scores, except on the elaboration score of Task 4 where GC speech students earned higher mean scores than CLA speech students.

Table 2 has the same form as Table 1 and compares GC female freshmen with CLA female freshmen enrolled in speech classes and GC male sophomores with CLA male Sophomores enrolled in speech classes. Only isolated significant differences appear.

Table .1

Comparison of Mean Creativity Test Scores of GC and CLA Students Enrolled in Introductory Speech and Logic Classes

	Speech Students			Logic Students		
	GC	CLA	t value[a]	GC	CLA	t value[a]
Fluency						
Task 1	5.4	6.7	2.49*	7.7	7.2	-1.26
Task 2	8.3	9.9	1.65	11.4	11.0	- .51
Non-Verbal	13.7	16.6	2.21*	19.1	18.2	- .85
Task 3	11.8	15.6	3.21**	14.5	14.2	- .38
Task 4	15.0	15.9	.54	15.5	16.5	.77
Verbal	26.8	31.6	1.47	30.0	30.7	.31
Grand Total	40.5	48.1	2.31*	49.2	48.9	- .11
Flexibility						
Task 1	4.9	5.8	1.74	6.5	6.2	- .80
Task 2	6.5	7.4	1.38	8.2	7.7	- .97
Non-Verbal	11.4	13.2	1.83	14.7	13.9	-1.06
Task 3	5.9	6.8	2.23*	6.5	6.4	- .30
Task 4	7.5	9.1	2.85**	7.9	9.6	2.60*
Verbal	13.5	15.9	3.07**	14.4	16.0	1.94
Grand Total	24.9	29.2	2.80**	29.1	29.9	.62
Originality						
Task 1	3.9	6.0	3.14**	4.4	5.6	2.36*
Task 2	5.9	9.3	3.15**	8.3	8.6	.36
Non-Verbal	9.7	15.3	3.93**	12.7	14.2	1.37
Task 3	10.5	14.4	2.85**	13.1	15.5	1.84
Task 4	10.4	11.8	.83	9.8	13.8	2.70**
Verbal	20.8	26.2	1.94	23.0	29.3	2.65**
Grand Total	30.6	41.5	2.94**	35.7	43.5	2.77**
Elaboration						
Task 1	8.1	8.1	.03	6.7	11.1	4.20**
Task 2	10.0	7.5	-1.91	9.4	12.1	2.16*
Non-Verbal	18.0	15.6	-1.15	16.1	23.3	3.50**
Task 3	2.1	2.1	.16	2.1	3.6	3.39**
Task 4	1.6	.5	-3.06**	.7	2.3	3.86**
Verbal	3.7	2.6	-1.72	2.8	6.0	4.18**
Grand Total	21.7	18.3	-1.47	19.0	29.2	4.18**

[a] negative t indicates GC mean higher

* significant at the .05 level ** significant at the .01 level

Table .2

Comparison of Mean Creativity Test Scores of GC and CLA Female Freshmen and Male Sophomores Enrolled in Introductory Speech Classes

	Female Freshmen			Male Sophomores		
	GC	CLA	t value[a]	GC	CLA	t value[a]
Fluency						
Task 1	4.5	6.7	2.24*	7.4	7.3	-.06
Task 2	7.8	8.2	.33	10.8	12.3	.59
Non-Verbal	12.3	14.9	1.49	18.2	19.6	.45
Task 3	15.0	14.8	- .08	11.8	16.6	1.60
Task 4	19.4	15.7	-1.19	16.0	15.1	- .28
Verbal	34.4	30.5	- .72	27.8	31.7	.67
Grand Total	46.7	45.4	- .19	46.0	51.3	.74
Flexibility						
Task 1	4.3	6.4	2.57*	6.3	5.9	- .36
Task 2	6.1	6.6	.48	7.6	9.1	1.00
Non-Verbal	10.3	13.0	1.80	13.9	15.0	.51
Task 3	6.8	6.7	- .05	6.2	6.8	.59
Task 4	7.8	9.0	.81	8.2	8.6	.26
Verbal	14.6	15.7	.61	14.4	15.3	.49
Grand Total	24.9	28.7	1.38	28.3	30.3	.65
Originality						
Task 1	3.8	8.1	2.77*	5.2	5.8	.37
Task 2	6.4	7.4	.52	5.5	12.1	2.34*
Non-Verbal	10.2	15.5	1.60	10.7	17.8	1.97
Task 3	13.6	13.4	- .07	9.7	14.6	1.48
Task 4	14.3	11.2	- .61	10.1	12.3	.68
Verbal	27.8	24.6	- .47	19.8	26.8	1.19
Grand Total	38.0	40.1	.25	30.5	44.7	1.62
Elaboration						
Task 1	9.8	8.8	- .44	5.5	8.2	1.12
Task 2	14.4	9.5	-1.60	6.0	6.9	.44
Non-Verbal	24.3	18.3	-1.28	11.5	15.1	.91
Task 3	3.0	1.2	-2.16*	1.2	3.3	2.21*
Task 4	2.4	.8	-1.70	.8	.4	.65
Verbal	5.4	2.0	-2.43*	2.0	3.7	1.30
Grand Total	29.7	20.3	-1.80	13.5	18.8	1.17

[a] negative indicates GC mean higher

* significant at the .05 level ** significant at the .01 level

Table 3 shows the comparisons on fluency for students enrolled in logic classes in GC and CLA. The only significant difference occurred in the comparison of GC freshmen males with GC sophomore males on Task 1 with the sophomores having the higher score.

Table 4 indicates that CLA sophomore men scored significantly higher on flexibility than did freshmen men on Task 1; their total non-verbal scores also were higher. When comparing all lower-classmen with CLA upperclassmen, we found that the latter group received significantly higher mean scores on Task 4, total verbal, and the grand total.

CLA freshmen and sophomore women scored significantly higher than freshmen and sophomore GC women on Task 4 and total verbal. It is important to point out here that significant differences in the total scores merely reflect the differences found on Tasks 1 and 4.

Table 5 shows that male upperclassmen scored significantly higher on originality than did lowerclassmen on Tasks 1 and 4. Female upperclassmen scored significantly higher than female lowerclassmen on Task 2. When we compared freshmen and sophomore women in GC and CLA, the CLA women scored significantly higher in originality on Task 4. These differences are generally reflected in the appropriate total scores.

Table 6 shows that CLA freshmen and sophomore men tested for differences in elaboration scored significantly higher than GC freshmen and sophomore men on Tasks 1 and 4. Upperclass males scored significantly higher than lowerclass males on all four tasks. CLA female lowerclassmen show mean scores significantly higher

than the scores of their GC counterparts for elaboration on Tasks 1, 2, and 4. Upperclass women scored significantly higher than lower class women on Task 3.

Table 7 shows the standard deviations for the GC and CLA students enrolled in speech and logic classes. The Table is presented with the caution that differences between freshmen and sophomores, and males and females are confounding the results. F ratios comparing the standard deviations are also presented.

Table 8 reflects the standard deviations of two special subgroups of students who registered to take speech classes.

Conclusions

1. One ought never to assume that introductory classes are composed primarily of beginning students. We discovered that almost one-third of the students registered in the CLA introductory logic class were juniors and seniors. This incorrect original assumption points up the need for careful preplanning and investigation before designing experiments.

2. The test results indicate only isolated differences between freshman and sophomores within CLA and within GC.

3. In comparing CLA freshmen and sophomore males with GC freshmen and sophomore males, we found that CLA men scored significantly higher than GC men only on elaboration for tasks 1 and 4. Otherwise, there seems to be little difference between underclass CLA men and underclass GC men as measured by this test.

Table .3

Fluency Mean Scores and F Ratios for GC Students
and CLA Students by College, Sex, and Year

MEAN SCORES

	MALE STUDENTS					FEMALE STUDENTS		
	GC		CLA			GC	CLA	
	Fresh	Soph	Fresh	Soph	Jr + Sr	Fr + So	Fr + So	Jr + Sr
Task 1	7.0	8.3	6.3	7.5	7.7	8.5	7.2	6.9
Task 2	10.6	10.7	9.9	11.2	12.5	13.1	9.2	12.0
Non-Verbal	17.6	18.9	16.2	18.8	20.2	21.6	16.4	18.9
Task 3	15.3	13.6	12.6	12.8	14.6	14.7	17.0	19.4
Task 4	16.9	13.8	13.1	16.8	19.4	15.0	15.2	18.6
Verbal	32.1	27.3	25.8	29.5	34.0	29.6	32.2	38.0
Grand Total	49.7	46.3	42.0	48.3	54.2	51.3	48.7	56.9

F RATIOS

	MALE STUDENTS					FEMALE STUDENTS		
	Among Groups	Fr, So vs. Jr, Sr	Fr, So GC vs. Fr, So CLA	Fresh vs. Soph CLA	Fresh vs. Soph GC	Among Groups	Fr, So vs. Jr, Sr	Fr, So GC vs. Fr, So CLA
Task 1	2.12	.48	1.12	3.02	3.90*	1.84	1.65	2.03
Task 2	.74	2.22	.01	.76	.00	1.67	.02	3.32
Non-Verbal	1.06	1.91	.10	1.68	.56	1.94	.11	3.77
Task 3	.99	.49	2.35	.00	1.13	1.17	1.71	.63
Task 4	2.00	3.89	.00	2.17	1.95	.63	1.25	.01
Verbal	1.56	2.67	.53	1.01	2.02	.98	1.73	.22
Grand Total	1.66	3.60	.52	1.83	.69	.51	.88	.14

* significant at the .05 level ** significant at the .01 level

Table 4

Flexibility Mean Scores and F Ratios for GC Students and CLA Students by College, Sex, and Year

MEAN SCORES

	MALE STUDENTS					FEMALE STUDENTS		
	GC		CLA			GC	CLA	
	Fresh	Soph	Fresh	Soph	Jr + Sr	Fr + So	Fr + So	Jr + Sr
Task 1	5.9	6.9	4.9	6.5	6.7	7.2	6.8	6.0
Task 2	8.0	7.7	6.8	7.9	8.4	8.6	8.0	6.9
Non-Verbal	13.9	14.6	11.7	14.5	15.2	15.8	14.8	14.9
Task 3	6.4	6.5	5.9	5.9	6.7	6.6	6.8	7.7
Task 4	8.2	8.1	8.1	9.1	11.2	6.9	11.0	10.0
Verbal	14.6	14.6	14.0	15.1	17.9	13.5	17.8	17.7
Grand Total	28.5	29.2	25.7	29.5	33.1	29.3	32.6	32.6

F RATIOS

	MALE STUDENTS					FEMALE STUDENTS		
	Among Groups	Fr, So vs. Jr, Sr	Fr, So GC vs. Fr, So CLA	Fresh vs. Soph CLA	Fresh vs. Soph GC	Among Groups	Fr, So vs. Jr, Sr	Fr, So GC vs. Fr, So CLA
Task 1	2.07	.87	.68	4.37*	2.34	.71	1.22	.20
Task 2	.86	1.05	.41	1.76	.21	.13	.09	.18
Non-Verbal	1.61	1.37	.75	4.03*	.31	.16	.07	.25
Task 3	.73	1.16	1.75	.01	.00	.80	1.56	.04
Task 4	2.77*	9.48**	.69	.96	.66	4.40*	1.15	7.65**
Verbal	1.97	7.34**	.00	.53	.00	3.08	1.67	4.50*
Grand Total	2.40	6.29**	.24	2.94	.10	.71	.40	1.01

* significant at the .05 level

** significant at the .01 level

Table 5

Originality Mean Scores and F Ratios for GC Students
and CLA Students by College, Sex, and Year

MEAN SCORES

	MALE STUDENTS					FEMALE STUDENTS		
	GC		CLA			GC	CLA	
	Fresh	Soph	Fresh	Soph	Jr + Sr	Fr + So	Fr + So	Jr + Sr
Task 1	4.2	4.3	4.4	5.5	6.7	4.6	6.3	6.4
Task 2	7.9	6.8	7.0	8.5	8.7	9.9	8.0	13.9
Non-Verbal	12.1	11.0	11.4	14.0	15.4	14.6	14.3	20.3
Task 3	14.3	12.5	14.8	12.9	16.5	12.2	18.6	21.1
Task 4	12.3	9.0	11.4	12.2	19.5	5.9	13.9	12.3
Verbal	26.6	21.5	26.2	25.1	36.0	18.1	32.4	33.4
Grand Total	38.7	32.5	37.6	39.1	51.4	32.7	46.8	53.7

F RATIOS

	MALE STUDENTS					FEMALE STUDENTS		
	Among Groups	Fr, So vs. Jr, Sr	Fr, So GC vs. Fr, So CLA	Fresh vs. Soph CLA	Fresh vs. Soph GC	Among Groups	Fr, So vs. Jr, Sr	Fr, So GC vs. Fr, So CLA
Task 1	2.49*	6.97**	1.67	1.33	.01	1.10	.69	1.51
Task 2	.69	.74	.30	1.03	.71	3.41*	5.75*	.02
Non-Verbal	1.72	3.71	1.08	1.79	.35	2.05	4.10	.01
Task 3	1.09	2.75	.02	.74	.87	2.74	2.79	2.68
Task 4	3.76*	12.94**	.37	.08	1.64	4.66*	1.44	7.89**
Verbal	2.98*	9.97**	.21	.07	1.68	4.02*	2.60	5.44*
Grand Total	3.69*	12.19**	.65	.09	1.83	4.21*	4.63*	3.80

* significant at the .05 level

** significant at the .01 level

Table 6

Elaboration Mean Scores and F Ratios for GC Students
and CLA Students by College, Sex, and Year

MEAN SCORES

	MALE STUDENTS					FEMALE STUDENTS		
	GC		CLA			GC	CLA	
	Fresh	Soph	Fresh	Soph	Jr + Sr	Fr + So	Fr + So	Jr + Sr
Task 1	5.4	7.4	9.2	9.0	12.8	8.3	17.8	12.6
Task 2	7.7	9.0	11.1	10.4	12.8	11.3	19.4	15.1
Non-Verbal	13.1	16.4	20.4	19.4	25.6	19.5	37.2	27.7
Task 3	2.0	1.9	3.4	2.8	4.7	2.6	3.9	5.6
Task 4	.6	.8	1.9	1.5	3.2	.8	4.4	1.7
Verbal	2.7	2.7	5.3	4.2	7.8	3.4	8.3	7.3
Grand Total	15.7	19.0	25.6	23.6	33.5	22.9	45.6	35.0

F RATIOS

	MALE STUDENTS					FEMALE STUDENTS		
	Among Groups	Fr, So vs. Jr, Sr	Fr, So GC vs. Fr, So CLA	Fresh vs. Soph CLA	Fresh vs. Soph GC	Among Groups	Fr, So vs. Jr, Sr	Fr, So GC vs. Fr, So CLA
Task 1	4.49*	11.66**	4.95*	.02	1.31	4.98*	.08	9.87**
Task 2	1.91	4.12*	2.89	.13	.49	2.44	.06	4.81**
Non-Verbal	4.26	10.32**	5.44*	.09	1.19	4.07*	.08	8.06**
Task 3	3.38*	10.10**	3.03	.49	.02	3.98*	6.18*	1.79
Task 4	7.25**	21.04**	7.12**	.78	.06	2.16	.05	4.27*
Verbal	6.01**	17.68**	5/62*	.76	.00	2.26	.67	3.866
Grand Total	6.57**	17.18**	7.86**	.29	.94	3.89*	.27	7.57*

* significant at the .05 level ** significant at the .01 level

Table 7

Comparison of the Standard Deviations of the Creativity Test Scores of GC and CLA Students Enrolled in Introductory Speech and Logic Classes

	Speech Students			Logic Students		
	GC	CLA	F Ratio	GC	CLA	F Ratio
Fluency						
Task 1	2.5	2.4	.92	2.3	2.4	.91
Task 2	4.7	5.6	2.32*	4.3	5.4	.63
Non-Verbal	5.5	6.9	1.54	5.8	7.0	.68
Task 3	5.3	6.1	1.35	5.7	6.2	.84
Task 4	7.6	7.9	1.09	8.0	8.1	.97
Verbal	16.3	12.8	.62	11.9	13.0	.84
Grand Total	14.8	16.4	1.23	14.8	16.3	.82
Flexibility						
Task 1	2.4	2.2	.86	2.6	2.3	1.27
Task 2	2.6	3.6	1.95*	3.1	2.9	1.10
Non-Verbal	4.0	5.1	1.64	4.7	4.5	1.10
Task 3	2.0	1.6	.61	1.8	2.1	.74
Task 4	3.9	4.0	1.01	3.1	4.0	.59*
Verbal	4.3	4.7	1.16	4.1	5.5	.56*
Gran	7.0	7.3	1.08	6.8	8.1	.70
Originality						
Task 1	2.7	3.9	2.11	3.0	3.3	.80
Task 2	3.2	7.0	4.64**	4.6	5.4	.73
Non-Verbal	4.3	9.1	4.63**	6.1	7.2	.71
Task 3	6.0	7.0	1.38	6.5	8.7	.56*
Task 4	8.5	7.4	.75	8.9	9.0	.98
Verbal	12.9	12.9	1.00	13.1	15.6	.71
Grand Total	15.5	20.0	1.69	15.4	18.6	.69
Elaboration						
Task 1	5.8	4.6	.62	5.7	7.0	.67
Task 2	6.6	4.8	.54*	6.2	8.7	.50**
Non-Verbal	11.0	7.6	.48*	10.1	14.0	.52*
Task 3	1.9	2.1	1.18	1.7	3.4	.25**
Task 4	2.1	.9	.20**	.8	3.4	.06**
Verbal	16.3	2.4	.60	2.1	5.9	.12*
Grand Total	14.8	8.3	.28**	10.8	17.8	.37**

* significant at the .05 level ** significant at the .01 level

Table 8

Comparison of the Standard Deviations of the Creativity Test Scores of GC and CLA Remale Freshmen and Male Sophomores Enrolled in Introductory Speech Classes

	Female Freshmen			Male Sophomores		
	GC	CLA	F Ratio	GC	CLA	F Ratio
Fluency						
Task 1	1.9	2.7	1.91	2.5	2.5	1.01
Task 2	2.4	3.9	2.70	3.6	7.0	3.87*
Non-Verbal	3.6	4.7	1.68	5.4	8.4	2.39
Task 3	6.1	5.1	.69	5.6	7.9	2.03
Task 4	9.0	7.9	.77	5.4	9.0	2.79
Verbal	4.6	10.5	.55	7.9	16.6	4.46*
Grand Total	6.6	13.9	.73	8.9	20.9	5.53*
Flexibility						
Task 1	1.6	2.3	2.09	2.6	2.4	.83
Task 2	2.1	2.9	1.96	2.8	3.9	1.94
Non- Verbal	3.2	3.8	1.41	3.7	5.9	2.53
Task 3	2.8	1.1	.15**	2.5	1.9	.59
Task 4	2.8	4.0	2.10	2.9	3.9	1.76
Verbal	4.6	3.9	.71	3.5	5.2	2.17
Grand Total	6.6	6.1	.85	5.1	8.6	2.89
Originality						
Task 1	2.4	4.8	3.90	3.6	3.4	.91
Task 2	4.3	4.6	1.18	2.2	8.6	15.84**
Non-Verbal	4.5	7.9	3.02	4.1	10.8	7.10**
Task 3	7.0	5.6	.63	6.9	8.3	1.43
Task 4	13.6	8.4	.38	5.7	8.5	2.27
Verbal	19.4	10.1	.27*	9.5	16.4	2.99
Grand Total	22.5	16.2	.52	10.6	25.9	5.93**
Elaboration						
Task 1	6.3	4.5	.51	5.2	5.8	1.25
Task 2	7.6	6.7	.76	5.0	4.8	.94
Non-Verbal	12.6	8.2	.43	9.5	8.8	.86
Task 3	2.4	1.2	.27*	1.4	2.6	3.54
Task 4	2.7	1.3	.23*	1.9	.8	.18
Verbal	4.0	2.1	.28*	2.7	3.2	1.47
Grand Total	14.3	8.7	.37	11.1	10.0	.81

* significant at the .05 level ** significant at the .01 level

4. Freshman and sophomore CLA females scored significantly higher than female lowerclassmen in GC on Task 4 for originality, Task 4 for flexibility, and Tasks 1, 2, and 4 for elaboration. Otherwise, no apparent differences between the two groups are identified by this test. The fact that Task 4 identifies differences not shown by the other three tasks raises some as-yet-unanswered questions about the test as a whole and specifically about Task 4.

5. When comparing freshman and sophomore men (in both colleges) with junior and senior men (in CLA) we found that the upperclassmen earned significantly higher scores on Task 4 for flexibility, Tasks 1 and 4 for originality, and Tasks 1, 3, and 4 for elaboration. Most interesting here is the fact that Task 4 seems to be measuring independently of the other tasks (see conclusion #4).

6. There seem to be no significant differences between female lowerclassmen and female upperclassmen except in isolated cases (Task 2 for originality and Task 3 for elaboration).

7. Generally, it appears that the difference between the scores of the GC students and the scores of the CLA students is smaller on this test of creativity than on the traditional tests most frequently used to compare the two groups.

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